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BOTANY.

The Trees and Shrubs of the Basin of the Red River of the North.—In a recent paper on the "Geographic Limits of Species of Plants in the Basin of the Red River of the North"¹ Mr. Warren Upham discusses a number of interesting problems in geographical botany. This basin lies between 45° and 52° north latitude, and 95° and 106° west longitude. At its lowest point at Lake Winnipeg its elevation above sea-level is 710 feet, and from this it rises to 2,700 feet in Northwestern Manitoba and Eastern Dakota. The temperature of this valley ranges from 90° Fahrenheit to —30°, or even —40°. The annual rainfall is from 20 to 30 inches.

The boundary between forest and prairie is traced as follows: Beginning near the junction of the north and south forks of the Saskatchewan River (about lat. 53° north, long. 105° west), and running southeasterly to Duck Mountain, the south end of Lake Manitoba and Lake Winnipeg, thence southerly from fifteen to fifty miles east of the Red River to Central Minnesota, where it bears eastward, passing out of the Red River basin. West of this line the region is chiefly grassland, while east of it the surface is almost wholly timbered. "Groves of a few acres, or sometimes a hundred acres or more, occur here and there upon the prairie region beside lakes, and a narrow line of timber usually borders the streams, as the Red River and its principal tributaries; but many lakes and creeks, and even portions of the course of large streams, have neither bush nor tree in sight, and occasionally none is visible in a view which ranges from five to ten miles in all directions."

Mr. Upham discusses the trees and shrubs of the region as follows: "Many species of trees, which together constitute a large part of the eastern forests, extend to the Red River basin, reaching there the western or northwestern boundary of their range. Among these are the basswood, sugar maple, river maple, and red maple, the three species of white, red, and black ash, the red or slippery elm, and the rock or cork elm, the butternut, the white, bur, and black oaks, ironwood (*Ostrya virginica* Willd.), the American hornbeam (*Carpinus caroliniana* Walt.), the yellow birch, the large-toothed poplar, white and red pine, arbor vitæ, and the red cedar or savin. A few species of far northern range find in this district their southern or south-

¹ Proc. Boston Society of Natural History, Vol. XXV., p. 140.

western limit,—namely, our two species of mountain ash, the balsam poplar, banksian or jack pine, the black and the white spruce, balsam fir, and tamarack.

“Some of the eastern shrubs, which make the undergrowth of our forests, also attain here their western limits; but a larger proportion of these than of the forest trees continues west along the stream-courses to the Saskatchewan region, the upper Missouri, and the Black Hills. Among the shrubs that reach to the borders of the Red River basin, but not farther westward, or at least southwestward, are the black alder or winterberry, and the mountain holly, staghorn sumach, the hardhack, the huckleberry, the dwarf blueberry, and the tall or swamp blueberry (*Vaccinium pennsylvanicum* Lam., and *V. corymbosum* L.), leath-erwood (*Dirca palustris* L.), and sweet fern. Shrubs and woody climbers, that have their northern or northwestern boundary in this basin, include the prickly ash, staff-tree, or shrubby bitter-sweet, frost grape, Virginian creeper, and the four species of round-leaved, silky, paniced, and alternate-leaved cornel (*Cornus circinata* L’Her., *C. sericea* L., *C. candidissima* Marsh [*C. paniculata* L’Her.], and *C. alternifolia* L. f.). On the other hand, shrubs of the north which reach their southern or southwestern limits in the Red River basin, include the mountain maple, the few-flowered viburnum and witherod, several species of honeysuckle (*Lonicera ciliata* Muhl., *L. cærulea* L., *L. oblongifolia* Hook., *L. involucrata* Banks, *L. hirsuta* Eaton), the Canada blueberry, the cowberry, *Andromeda polifolia* L., *Kalmia glauca* Ait., Labrador tea (*Ledum latifolium* Ait.), the Canadian shepherdia, sweet gale, the dwarf birch, green or mountain alder, beaked hazel-nut, *Salix balsamifera* Barratt, and *S. myrtilloides* L., var *pedicellaris* Anders., black crowberry, creeping savin, and the American yew or ground hemlock.

“No tree of exclusively western range extends east to the Red River basin, and it has only a few western species of shrubs, of which the most noteworthy are the alder-leaved June-berry or service berry (in Manitoba commonly called ‘saskatoon’), the silver-berry (*Eleagnus argentea* Pursh), and the buffalo-berry (*Shepherdia argentea* Nutt.). To these are also to be added the shrubby *Oenothera albicaulis* Nutt., which occurs chiefly as an immigrant weed, and the small-leaved false indigo (*Amorpha microphylla* Pursh), which abounds on moist portions of the prairie. The silver-berry (usually called ‘wolf willow’ in the Red River valley) is common or abundant from Clifford, North Dakota, and from Ada, Minnesota, northward, forming patches ten to twenty rods long on the prairie, growing only about two feet high and

fruiting plentifully, but in thickets becoming five to ten feet high. Its silvery whitish foliage and fruit make this shrub a very conspicuous and characteristic element of the Red River flora.

"The single species of true sage-brush belonging to this basin (*Artemisia cana* Pursh) extends east in North Dakota to the Heart Mound, six miles northwest of Walhalla, or thirty-five miles west of the Red River at Pembina, and to a hill close west of the Cheyenne River about eight miles south of Valley City, growing in both places on outcrops of the Fort Pierre shale. It attains a height of one to three feet, and the tough wood of its base is one to one and a half inches in diameter. *Artemisia frigida* Willd., called 'pasture sage-brush' by Macoun, is abundant throughout a wide area westward, extending east locally to 'the ridge' east of Emerson, Manitoba, the Falls of St. Anthony, and Lake Pepin."

The Bearberry in Central Nebraska.—Another of the puzzles in the geographical botany of the plains has recently turned up in the discovery of the bearberry (*Arctostaphylos uva-ursi* Spreng.) in a cañon in Custer county, in the center of the state. When it is remembered that this station is midway between the Missouri River and the foothills of the Rocky Mountains, and that the plains extend for hundreds of miles in every direction, and further, that it is in what is known as the "sand-hill belt," it puzzles one to account for the presence of this unlooked-for shrub.

Bearberry occurs in the Black Hills and in the Rocky Mountains. Northeastward its nearest station is near Lake Pepin in Minnesota. It does not occur in Iowa. In Missouri it occurs in the southeastern part only. It is doubtfully admitted by B. B. Smyth to his list of Kansas plants.

The Nebraska station is in the basin of the Loup River, a stream whose numerous branches are wholly confined to the central part of the state, all having their sources in the numberless springs of the "sand-hills." How did the Nebraska bearberry find its way to this out-of-the-way spot?—CHARLES E. BESSEY.